

Cattle Cycle Nears End of Contraction

July 2000

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The July *Cattle* inventory report indicated that the number of cows has continued to decline, but that rate of decline is very small. In addition, large numbers of cattle in feedlots, low grain prices, and a surprisingly large calf crop in 2000 all suggest that beef supplies will be larger than previously thought and that cattle prices will be somewhat weaker over the next year.

The start of expansion in cow numbers is likely to begin in the next 12 months, although beef producers are still not retaining enough heifers to get the expansion underway at this point. The expansion is expected to be moderate in size.

Even though beef cow numbers have been dropping since 1995, total beef production has continued to rise. This is due to the increase in the productivity of the remaining cows. The amount of beef produced per cow is rising at a rate of about 1.8% per year, while domestic and foreign demand is only increasing at about 1.3% per year. This means that productivity growth will likely tend to outpace demand growth, and as a consequence, brood cow numbers will decrease slowly overtime.

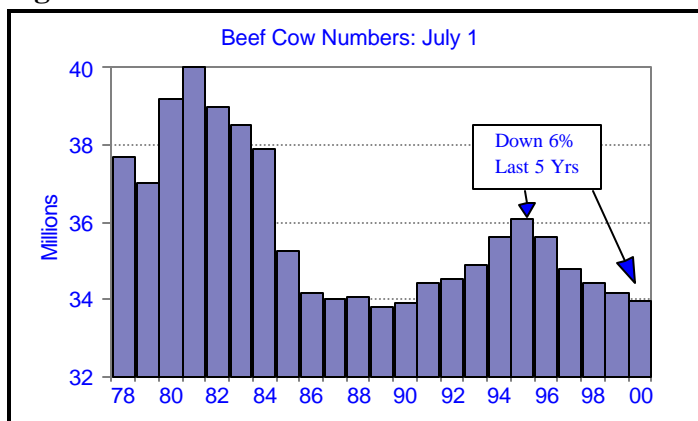
Prices of calves and feeder cattle will be quiet strong during the next 12 months as a result of strong fed cattle prices and low feed prices. The general direction is for cattle prices to move upward, so putting more weight on calves, or even retained ownership are logical strategies for brood cow operations.

The Numbers

The total number of cows was down a very modest .2%. In other words the total cow herd is nearly the same as last year. Beef cow numbers did continue to drop, but dairy cow numbers grew. The

number of beef cows stood at nearly 34 million head, down .6% from year-ago numbers. On the other hand, dairy cow numbers grew slightly over 1%.

Figure 1



The July report only provides state data on 11 states. This is of course a limited view of the country, but some beef cow expansion appeared in the Northern Plains states of Colorado, South Dakota, and Montana. Milk cow numbers continued to increase in California, but decline in Wisconsin.

The number of beef replacement heifers was down by 2%. This indicates that beef producers are still not strongly inclined to increase the herd size. Rather, a larger portion of beef heifers have been headed to the feedlot, as brood cow operations have chosen to sell high valued heifer calves rather than retain them for breeding. In the July *Cattle on Feed* report, the number of heifers in the feedlots were up 9% while steer calf numbers were up 8%. As shown in **Figure 1**, the beef cow herd has been in decline for 5 years, since 1995. The total decline from that time has been 6%. Beef cow numbers are expected to begin to increase in 2001 as the next production cycle begins. This means that some additional heifer retention will take place. However, at this point, one must believe that the expansion will be modest with historic low returns to brood cows over the past decade, and the current high interest rates.

Dairy producers are already increasing the number of milk cows, and dairy heifers being retained for milk production are unchanged, which means that the dairy herd may not expand much more than it already has.

The supply of cattle for slaughter over the last-half of 2000 will come from the inventory categories which include steers over 500 pounds and non replacement heifers over 500 pounds. While steer numbers in this category were down .7%, heifer numbers were unchanged. Thus fed supplies for the next six months are down a modest .4%. This means that fed supplies will not be much different than one year ago. Fed supplies for the first-half of 2001 will come from calves that were under 500 pounds on July 1 which were down a modest .7%.

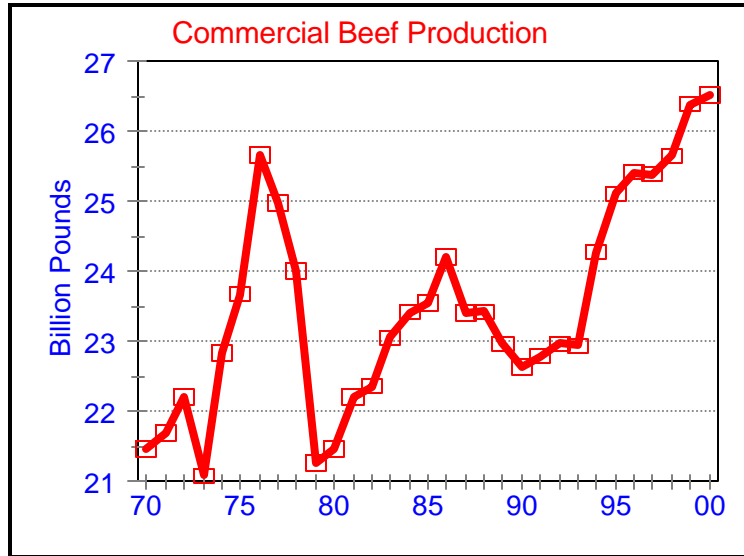
The estimated calf crop for 2000 was a surprisingly high 38.9 million head reflecting a calving rate of about 91% of the size of the January 1 total cow inventory. If this size of calf crop is realized it will be .5% larger than the 1999 crop, and set a tone toward increasing beef supplies in the last-half of 2001. Most would have expected this year's calf crop to be down modestly, but moderate weather this past winter resulted in a higher survival rate. The bottom line from all these numbers is that beef supplies will only be down modestly over the next 12 months and then may very well begin to rise again.

Cattle on feed numbers in July remained at 9% above year-ago levels. Placements in the month of June were down 7%, but this followed a 12% increase in May. Marketings in June were unchanged, which means that abundant heavyweight cattle are market ready for the remainder of the summer.

Beef Supplies Begin to Drop

It now appears that beef supplies for the year of 2000 will actually rise rather than fall as most felt earlier in the year. At the beginning of this year, first-half beef supplies were expected to be down 4% to 5%. My current estimates are for 2000 supplies to actually increase a modest .5%. During the first-half of 2000 beef supplies were up 3%, and are expected to be down by 2% in the last-half. This

Figure 2



means that commercial beef production will once again rise in 2000 to 26.5 billion pounds as seen in **Figure 2**.

What happened in the first-half of the year to increase beef supplies sharply above expectations? The answer appears to be two-fold. First, the rapid movement of cattle into feedlots helped increase how quickly cattle got to market, and winter weather was moderate so weight gains were rapid. However, it also appears that the total inventory of animals may have been underestimated. This can be seen in appendix Table 2 where

the ratio of cattle slaughtered in the first-half of 2000 was a record high relative to supplies of calves at mid-year 1999 (see the ratio of 49.7 in Table 2).

Helping to moderate total slaughter supplies over the next 12 months will be a low rate of cow and bull slaughter as estimated in appendix Table 3. The number of cows and bulls slaughtered in the first-half of 2000 continued to drop, and that trend is expected over the next 12 months. This is driven by the strong returns for brood cows and the desire to keep the old cows in production for a longer period of time. Heifer calves are worth a great deal relative to their mothers, so avoidance of cow replacement will continue. Of course this means that the average age of the cow herd will grow, a trend which cannot be maintained over time.

Total beef supplies are expected to be down about 2% in the last-half of this year, and down 3% to 4% for the first-half of 2001. These declines are based upon the anticipation of continued slowing in cow slaughter as well as a slower movement of calves through feedlots.

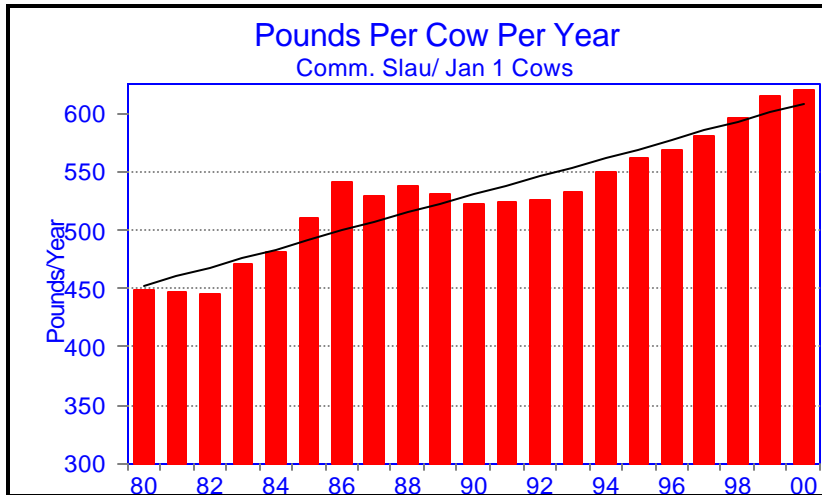
Less Cows But More Beef

If cow numbers have been falling for five years, how can the industry be experiencing record production? The answer, of course, is that the productivity of the cow herd has been rising. Simply put, each cow is producing more beef than she did in previous years as shown in **Figure 3**. In 1980 each cow averaged about 450 of carcass beef produced per year. By 2000, production had risen to 620 pounds of carcass beef per cow per year. This 170 pound increase in a 20 year time span represents an average annual productivity gain of 1.8% per year.

Let's look back over the past five years to see how productivity gains have compensated for fewer cow numbers. This can be seen visually by looking at the declines in beef cow numbers since 1995 in **Figure 1**, but with increasing beef production shown in **Figure 2**. From 1995 until 2000, beef cow inventories dropped 6%, but pounds of beef per cow increased by 10%. Thus productivity gains have

been greater than the decline in cow numbers over this period, and production continued to rise.

Figure 3



The primary source of productivity gains is heavier weights. Over the past 20 years, while annual productivity gains have averaged 1.8%, weight gain has accounted for 1.1% of the total per year. All other productivity increases have accounted for about .7% per year. These involve the ability

to produce more calves from a given number of brood cows and include fewer non-productive cow days, and higher calving rates.

The significance of productivity growth cannot be overlooked with regard to implications on the industry. First the decline in cow numbers since 1995 has been a very modest 2 million head. In contrast, the liquidation phase of the previous beef cow cycle from 1981 to 1989 reduced the size of the herd by 6 million head. This means producers should not get wildly optimistic about price prospects, because the liquidation has not been that large. Second, productivity gains at 1.8% per year are greater than aggregate demand growth. Aggregate demand growth is around 1.3% per year and is a combination of the growth in the domestic market (about .9% per year) and the export market (about .4% per year). Thus, productivity growth at 1.8% per year can meet the growth in demand. As a consequence beef cow numbers will likely decline slowly over time.

Prices May Not be As Strong as Thought

Prices during most of 1999 and the first-half of 2000 were stimulated by an “unknown factor,” which we commonly refer to as improved demand. Looking at the numbers in the table below, you will see an unusual state of events in the cattle industry....larger supplies and higher prices. For example, in the third quarter of 1999, beef supplies were up by 3% and steer prices were up by over 10%. Larger supplies and higher prices is hard to explain, so economist often call this improved demand. This continued through the second quarter of 2000. However, this summer some of the magic seems to be fading, as beef supplies **decline** by 2.5%, and prices rise 5%. The same type of relationships are forecast for the remained of 2000 and the first-half of 2001. This summer's modest prices fit the

Beef Production				Finished Steer Prices			
Year	Qtr.	Beef Prod. Mill. #'s	% Change Year-Ago	Year	Qtr.	Neb. Steers \$/Cwt.	% Change Year-Ago
1999	I	6,397	2.9%	1999	I	\$62.43	1.1%
	II	6,627	2.6%		II	\$65.04	1.5%
	III	6,838	3.0%		III	\$65.12	10.4%
	IV	6,522	2.9%		IV	\$69.65	14.1%
	<u>Year</u>	<u>26.384</u>	<u>2.8%</u>		<u>Year</u>	<u>\$65.56</u>	<u>6.7%</u>
2000	I	6,653	4.0%	2000	I	\$69.32	11.0%
	II	6,750	1.9%		II	\$71.63	10.1%
	III	6,666	-2.5%		III	\$68.43	5.1%
	IV	6,453	-1.1%		IV	\$69.96	0.4%
	<u>Year</u>	<u>26.522</u>	<u>0.5%</u>		<u>Year</u>	<u>\$69.84</u>	<u>6.5%</u>
2001	I	6,347	-4.6%	2001	I	\$70.90	2.3%
	II	6,531	-3.2%		II	\$72.19	0.8%

“economist model” much better. While those of last year, were “off the chart.”

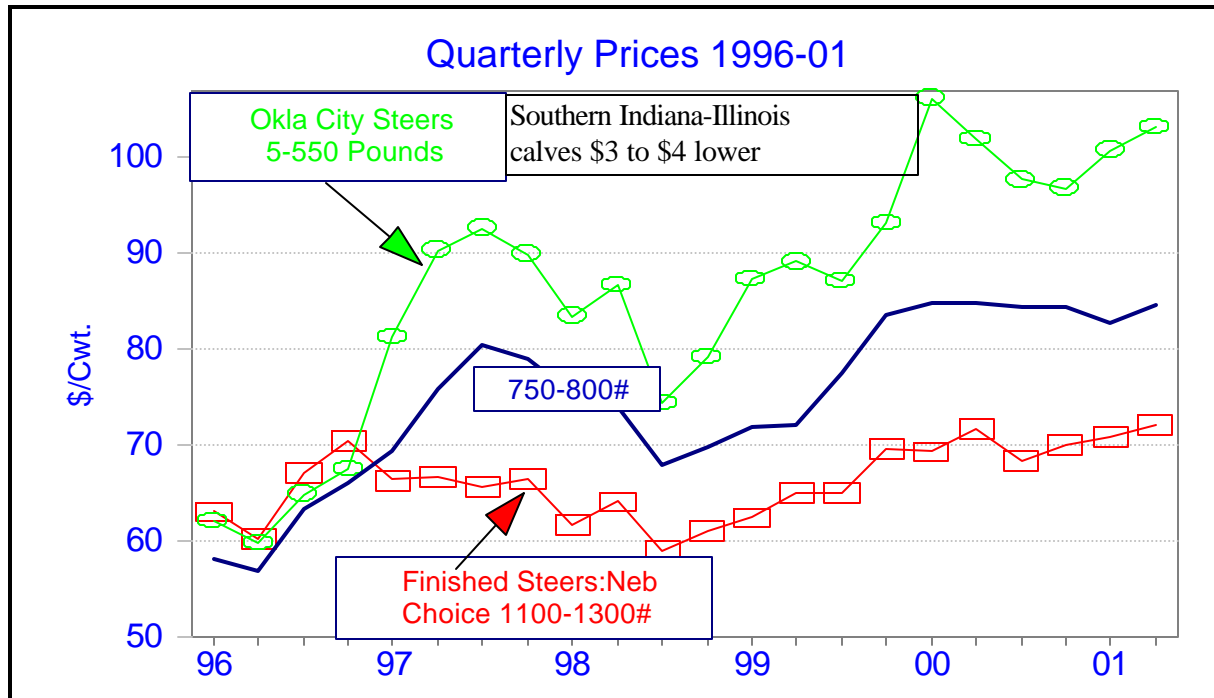
So what does this mean for the future? If demand were to be as strong as it was in 1999, with the declines in supplies forecast for the spring of 2001, prices of Nebraska choice steers could reach \$80. You can see my more moderate forecast at about \$72 for a spring quarter average which would allow daily highs to reach into the mid-\$70s, likely in late March and April. For my estimates, I assume that demand will be closer to historic levels, and thus not as strong as in 1999.

Finished cattle prices should begin to recover late this summer back toward the higher \$60s. Current price estimates are for Nebraska choice steers to average about \$68 for the third quarter. Further strength is expected for the fourth quarter with prices averaging near \$70. Smaller supplies will continue to enhance prices in the first-half of 2001 with the first quarter average estimated near \$71 and the second quarter averaging near \$72. Daily highs in late March and April could reach toward the mid-\$70s. These price estimates are shown in the table above as well as in Table 5 in the appendix.

How strong will calf prices be this fall? Supplies will be only slightly smaller than the fall of 1999, corn prices will likely be modestly lower, but interest rates are sharply higher. This means that fall calf prices may not be substantially different that last fall when Oklahoma City 500 to 550 pound steers averaged \$93 per hundredweight (these are shown in Table 5 and **Figure 4**). Prices are expected to be about \$3 stronger this fall, averaging \$96 per hundredweight. Prices in Southern Illinois and Indiana tend to be \$3 to \$4 lower than these prices.

Some added strength can be expected for eastern Corn Belt calf prices in the winter and next spring with winter prices in the higher \$90s and spring prices once more topping \$1 a pound.

Figure 4



Feeder cattle prices will be driven by the strength of fed cattle prices as well as by feed prices and interest rates. Prices of 750 to 800 pound steers this fall at Oklahoma City are expected to average about \$84, the same as last fall. Prices are expected to drop a couple of dollars in the winter and then return to the \$84 level in the spring. In general, these price levels are not as high as the feeder cattle futures market has recently been anticipating.

Implications for the Industry

The coming 12 months will be a period of high cattle prices driven by lower beef supplies, and abundant and cheap feed. Retention of heifers to move the industry toward expansion is expected to begin in the next year. The additional retention of heifers for breeding replacements will draw beef supplies even lower and provide for very favorable prices. Expansion is not expected to be large due to the generally poor returns for brood cow operations over the last decade, and current high interest rates.

The issue of beef demand will be important in the coming year. Strong beef demand was evident in 1999 and the first-half of 2000. However by summer of 2000, demand seemed to be edging back to more historical levels. At the same time, there have been indications that the growth in chicken demand is slowing. Beef producers have hoped for a turn-around in sagging demand for years, at least some signs point to improvement, although current demand conditions do not appear to be as favorable as in 1999 and early 2000.

Profits from brood cow operation will be outstanding over the next 12 months. Calf prices for this year's calf crop are the best since 1993, and 2001 calf prices should also be very high. In general, cattle prices are expected to rise over the next 12 months, so this favors adding more weight to calves, especially with low grain prices and abundant forage supplies this fall. Retained ownership should also be considered if facilities, feed, and labor are available.

Cattle feeding margins will be thinned by high priced feeder cattle and high interest rates. The biggest question for fed prices is whether consumer demand can provide even higher prices.

Table 1. Cattle Number, 1991 - 2000

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	% Change vs. 99
All cattle and calves											
January 1	98,896	99,559	99,176	100,988	102,755	103,487	101,656	99,744	99,115	98,048	-1.1
July 1	109,000	109,200	109,000	111,300	113,000	111,500	109,200	107,700	107,000	106,400	-0.6
Beef cows											
January 1	33,271	33,775	33,365	34,650	35,156	35,228	34,458	33,885	33,745	33,546	-0.6
July 1	34,400	34,550	34,900	35,600	36,100	35,600	34,800	34,400	34,150	33,950	-0.6
Milk cows											
January 1	10,156	9,913	9,658	9,528	9,487	9,416	9,318	9,199	9,133	9,188	0.6
July 1	10,000	9,850	9,700	9,500	9,500	9,400	9,300	9,200	9,150	9,250	1.1
Heifers 500 lbs. + Beef replacement											
January 1	5,605	5,761	6,092	6,365	6,475	6,179	6,042	5,764	5,535	5,530	-0.1
July 1	5,300	5,700	5,700	5,900	5,700	5,500	5,300	5,000	4,800	4,700	-2.1
Milk replacement											
January 1	4,220	4,202	4,176	4,144	4,141	4,104	4,058	3,986	4,069	3,954	-2.8
July 1	4,200	4,200	4,000	4,000	3,900	3,700	3,600	3,600	3,700	3,700	0.0
Other heifers 500 lbs. +											
January 1	8,357	8,142	8,550	9,068	9,275	9,949	10,212	10,051	10,170	10,045	-1.2
July 1	7,400	7,100	7,300	7,500	8,000	8,100	8,200	8,100	8,100	8,100	0.0
Steers 500 lbs. +											
January 1	16,369	16,755	16,940	17,042	17,463	17,732	17,392	17,189	16,891	16,652	-1.4
July 1	15,100	15,100	14,900	15,200	15,400	15,100	14,800	14,600	14,400	14,300	-0.7
Bulls 500 lbs. +											
January 1	2,228	2,279	2,278	2,307	2,390	2,392	2,350	2,270	2,281	2,294	0.6
July 1	2,200	2,200	2,200	2,300	2,400	2,400	2,300	2,200	2,200	2,100	-4.5
All Calves < 500 lbs.											
January 1	18,691	18,733	18,117	17,884	18,369	18,488	17,826	17,401	17,290	16,840	-2.6
July 1	30,400	30,500	30,300	31,300	32,000	31,700	30,900	30,600	30,500	30,300	-0.7
Calf Crop	39.026	39.290	39.448	40.059	40.211	39.776	38.961	38.812	38.710	38.900	2000vs99 0.5

Table 2: Ratios of Commercial Slaughter Steers and Heifers to Beginning Cattle Inventories, 1985 to 2001

	July 1 Inventory	Second Half	Ratio	Calves <	First Half	Ratio
	Steers and Heifers	Steer and Heifer		500 Pounds	Steer and Heifer	
	500+ ^b	Slaughter		July 1	Slaughter Next	
	thousand head			thousand head		
1985	24,200	14,056	58.1	33,600	14,219	42.3
1986	23,300	14,394	61.8	32,200	14,046	43.6
1987	22,400	14,304	63.9	31,100	13,989	45.0
1988	21,800	14,101	64.7	31,000	13,564	43.8
1989	21,600	13,470	62.4	30,600	13,425	43.9
1990	21,600	12,901	59.7	30,300	13,048	43.1
1991	22,500	13,397	59.5	30,400	13,137	43.2
1992	22,200	13,231	59.6	30,500	13,101	43.0
1993	22,200	13,472	60.7	30,300	13,576	44.8
1994	22,700	14,038	61.8	31,300	14,119	45.1
1995	23,400	14,554	62.2	32,000	14,742	46.1
1996	23,200	13,831	59.6	31,700	14,680	46.3
1997	23,000	14,861	64.6	30,900	14,446	46.8
1998	22,700	14,447	63.6	30,600	14,794	48.3
1999	22,500	15,001	66.7	30,500	15,173	49.7
2000 ^a	22,400	14,555	65.0	30,300	14,629	48.3

^a Projected for next 12 months

^b Excluding replacement heifers

Table 3. Cow Inventory, July 1 and Cow and Bull Slaughter for the Following Year

	Cow	Cow	Ratio	Bull Slaughter	Ratio Bull Slaughter
	Inventory	Slaughter	/Inventory		to Cow Slaughter
	----thousand head----			thousand head	
1985	46,182	7,765	16.8	738	9.5
1986	45,000	7,319	16.3	710	9.7
1987	44,400	6,398	14.4	665	10.4
1988	44,300	6,400	14.4	650	10.2
1989	43,900	5,982	13.6	666	11.1
1990	44,000	5,720	13.0	634	11.1
1991	44,400	5,659	12.7	621	11.0
1992	44,400	5,964	13.4	656	11.0
1993	44,600	6,008	13.5	662	11.0
1994	45,100	6,052	13.4	661	10.9
1995	45,600	6,545	14.4	689	10.5
1996	45,000	7,007	15.6	715	10.2
1997	44,100	6,351	14.4	666	10.5
1998	43,600	5,846	13.4	615	10.5
1999	43,300	5,632	13.0	647	11.5
2000 ^a	43,200	5,616	13.0	608	10.8

^a Projected for next 12 months

Table 4. Commercial Beef Slaughter, Production, and Dressed Weights, 1983-2001

Year	Slaughter (1,000 hd)	Weight (lb)	Production (lbs)	Slaughter (1,000 hd)	Weight (lb)	Production (lbs)
	-----January-March-----			-----April-June-----		
1983	8,735	632	5,525	8,844	627	5,549
1984	9,169	623	5,708	9,341	623	5,819
1985	8,936	637	5,691	9,023	656	5,917
1986	8,884	649	5,769	9,574	652	6,247
1987	8,765	657	5,756	8,878	646	5,737
1988	8,575	664	5,696	8,759	660	5,784
1989	8,180	676	5,529	8,694	664	5,777
1990	8,117	678	5,507	8,541	671	5,733
1991	7,858	685	5,383	8,299	686	5,694
1992	8,032	697	5,597	8,255	693	5,726
1993	7,910	677	5,357	8,469	672	5,690
1994	8,162	704	5,745	8,615	702	6,042
1995	8,418	699	5,888	9,053	699	6,325
1996	8,971	703	6,303	9,589	693	6,642
1997	8,912	686	6,112	9,307	690	6,419
1998	8,681	716	6,215	8,995	718	6,461
1999	8,733	733	6,397	9,161	723	6,627
2000	9,005	739	6,653	9,197	734	6,750
2001 ^a	8,624	736	6,347	8,935	731	6,531
	-----July-September-----			-----October-December-----		
1983	9,547	630	6,012	9,537	626	5,974
1984	9,559	622	5,949	9,503	624	5,933
1985	9,352	659	6,166	8,978	643	5,774
1986	9,654	650	6,275	9,180	645	5,925
1987	9,222	657	6,063	8,783	666	5,852
1988	9,199	672	6,186	8,538	674	5,575
1989	8,612	684	5,892	8,430	686	5,785
1990	8,449	689	5,814	8,112	687	5,564
1991	8,453	711	6,012	8,074	707	5,710
1992	8,451	709	5,991	8,122	696	5,654
1993	8,673	700	6,076	8,268	704	5,819
1994	8,825	723	6,377	8,629	709	6,114
1995	9,279	714	6,625	8,890	706	6,277
1996	9,123	700	6,390	8,900	684	6,084
1997	9,300	710	6,603	8,879	704	6,258
1998	9,071	732	6,638	8,737	726	6,339
1999	9,337	732	6,838	8,914	732	6,522
2000 ^a	9,045	737	6,666	8,803	733	6,453

^a Projected for next 12 months

Table 5. Beef, Pork, Poultry Production, Nebraska Steer Prices, and Oklahoma City Feeders by Quarter

	Beef Production	Pork Production	Poultry Production	Nebraska Choice Steer Price	Oklahoma City 5-550 Steers	Oklahoma City 750-800 Steers	
	million pounds				\$/cwt.		
1991	I	5,383	3,901	5,821	80.89	109.37	91.16
	II	5,694	3,792	6,311	79.34	112.00	93.42
	III	6,012	3,821	6,415	70.29	101.91	87.66
	IV	5,710	4,434	6,338	70.60	94.76	81.88
1992	I	5,595	4,321	6,314	75.95	95.72	79.56
	II	5,723	4,033	6,624	77.18	93.44	80.71
	III	5,990	4,264	6,816	72.84	94.16	83.50
	IV	5,660	4,567	6,644	76.49	91.17	81.72
1993	I	5,357	4,204	6,542	80.65	99.51	85.76
	II	5,690	4,151	6,987	79.78	104.17	86.80
	III	6,076	4,140	7,027	73.77	100.08	87.99
	IV	5,819	4,535	6,970	71.23	94.83	85.27
1994	I	5,745	4,182	6,765	73.10	98.96	82.14
	II	6,042	4,240	7,238	68.79	94.16	77.63
	III	6,377	4,326	7,504	66.37	86.42	76.37
	IV	6,114	4,913	7,339	67.63	84.58	74.74
1995	I	5,888	4,488	7,343	71.51	86.81	72.62
	II	6,325	4,394	7,653	64.73	78.62	65.77
	III	6,625	4,240	7,472	62.65	68.29	65.44
	IV	6,277	4,690	7,683	66.10	64.45	67.55
1996	I	6,303	4,389	7,880	63.06	62.12	58.11
	II	6,642	4,104	7,949	60.26	59.83	56.79
	III	6,390	4,143	8,043	67.35	64.90	63.29
	IV	6,084	4,449	7,930	70.39	67.49	66.15
1997	I	6,107	4,194	7,875	66.40	81.28	69.44
	II	6,416	4,091	8,341	66.63	90.28	75.88
	III	6,603	4,194	8,275	65.65	92.65	80.44
	IV	6,258	4,767	8,259	66.56	89.90	78.98
1998	I	6,215	4,687	8,135	61.73	83.44	75.49
	II	6,461	4,429	8,316	64.11	86.71	74.00
	III	6,638	4,625	8,244	58.97	74.41	67.89
	IV	6,339	5,239	8,452	61.06	79.21	69.80
1999	I	6,397	4,865	8,501	62.43	87.35	71.93
	II	6,627	4,630	8,928	65.04	89.12	72.17
	III	6,838	4,672	8,848	65.12	87.12	77.57
	IV	6,522	5,110	8,760	69.65	93.20	83.87
2000	I	6,653	4,824	8,886	69.32	106.13	84.91
	II ^P	6,750	4,500	9,150	71.63	101.90	84.82
	III	6,666	4,609	9,175	68.43	97.69	84.44
	IV	6,453	5,067	9,200	69.96	96.75	84.41
2001	I	6,347	4,781	9,275	70.9	100.72	82.66
	II	6,531	4,575	9,500	72.19	103.22	84.67

^P Preliminary

Prices are point estimates, but users should look at a range of possible prices at least in a band that both adds and subtracts the following \$/cwt. These are the estimation errors:

Nebraska steers: \$2.00/cwt. 550 to 600 # steers: \$2.50/cwt. 750 to 800 # steers: \$3.00/cwt.

This range has included about 67% of the prices from the historical price estimates.